What is claimed is:

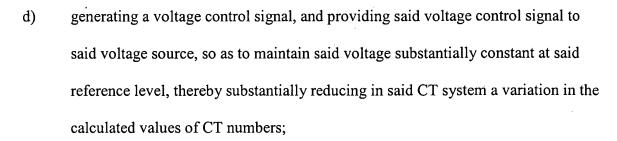
- 1. A method of stabilizing the calculation of CT (computed tomography) numbers by a CT system, the CT system including an x-ray source for generating x-rays in response to a voltage supplied by a voltage source, the method comprising:
 - a) calculating the CT number of a sample having a known CT number value;
 - b) adjusting the voltage supplied by the voltage source to a reference level for which the calculation in step (a) yields said known CT number value; and
 - c) measuring the energy spectrum of the x-rays generated by the x-ray source;
 - d) adaptively regulating the voltage based on the spectrum measured in step (c), so as to prevent any deviation in the voltage from said reference level determined in step (b); and
 - e) maintaining the voltage substantially constant at said reference level by repeating steps (c) and (d) during subsequent CT number measurements by said CT system.
- 2. A method according to claim 1,
 - A. wherein measuring the energy spectrum of the x-rays in step (c) comprises:
 - i) using a principal detector to detect x-rays emitted by said x-ray source so as to generate a first intensity magnitude;
 - ii) using an auxiliary detector to detect x-rays emitted by said x-ray source so as to generate a second intensity magnitude, said auxiliary detector including an absorber that preferentially absorbs x-ray photons having a relatively low energy;

and

- B. wherein regulating the voltage in step (d) comprises:
- (i) generating a control signal proportional to a known function of said first and second intensity magnitudes; and
- (ii) adjusting said voltage based on said control signal.
- 3. A method according to claim 2, wherein said absorber is made of a material adapted to optimize the sensitivity of said known function to fluctuations in said voltage from said reference level.
- 4. A method according to claim 3, wherein said absorber is selected from the group consisting of copper, molybdenum, and tungsten.
- 5. A method according to claim 2, wherein said known function of said first and second intensity magnitudes comprises a ratio of the first and second intensity magnitudes.
- 6. A method according to claim 1, wherein regulating the voltage in step (d) comprises providing to the voltage source a voltage control signal proportional to the deviation in voltage from said reference level.
- 7. A method according to claim 1, wherein the variation in the values of CT numbers measured by said CT system is reduced to less than about 0.1%.
- 8. A method according to claim 1,

wherein the deviation of said voltage from said reference level is maintained to less than about 0.03 %.

- 9. A method according to claim 1, further comprising:
 - i) recording, after step (b), the measured x-ray energy value resulting from the adjustment of said voltage in step (b); and
 - ii) in step (d), regulating the voltage so that the measurement of the x-ray energy in step (c) yields the value recorded in step (i).
- 10. A method according to claim 1, wherein said sample having a known CT number value comprises water.
- 11. A method of stabilizing the measurement of CT numbers by a CT system, the CT system including an x-ray source for generating x-rays in response to a voltage provided by a voltage source, the method comprising:
 - a) establishing a reference level for said voltage by adjusting the voltage to a value for which calculation by said CT system of the CT number of a sample having a known CT number value yields said known CT number value;
 - b) using a principal detector to detect x-rays generated by said x-ray source so as to generate a first intensity magnitude;
- c) using an auxiliary detector to detect x-rays generated by said x-ray source so as to generate a second intensity magnitude, wherein said auxiliary detector includes an absorber that preferentially absorbs x-ray photons having a relatively low energy;



wherein said voltage control signal is proportional to a known function of said first and second intensity magnitudes.

12. A CT system, comprising:

- a) an x-ray source for generating x-rays in response to a voltage provided by a voltage source;
- b) a detection system for detecting x-rays generated by said x-ray source and transmitted through a target object;
- c) a kV meter for measuring an energy spectrum of x-rays generated by said x-ray source;
- d) a processor for calculating the CT numbers of said target object; and
- (e) a feedback controller for providing to the voltage source a voltage control signal;

wherein the energy spectrum measured by said kV meter is used to adjust said voltage control signal so as to maintain said voltage substantially constant at a reference level established during calibration, and

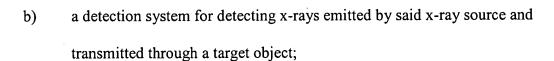
wherein said reference level is the voltage level at which calculation by said CT system of the CT number of a sample having a known CT number value yields the correct known CT number value.

13. A CT system according to claim 12,

wherein said kV meter includes a principal detector for detecting x-rays generated by said x-ray source so as to generate a first intensity magnitude, and an auxiliary detector for detecting x-rays generated by said x-ray source so as to generate a second intensity magnitude, said auxiliary detector including an absorber that preferentially absorbs x-ray photons having a relatively low energy; and

wherein said voltage control signal is proportional to a known function of said first and second intensity magnitudes.

- 14. A CT system according to claim 12, wherein said known function of said first and second intensity magnitudes comprises a ratio of said first and second intensity magnitudes.
- 15. A CT system according to claim 12, wherein at least one of said principal detector and said auxiliary detector comprises a semiconductor detector.
- 16. A CT system according to claim 12, wherein said detector system includes an array of detectors.
- 17. A CT system for performing stabilized CT number measurements, said CT system comprising:
 - a) an x-ray source for generating x-rays in response to a voltage provided by a voltage source;



- c) a kV meter, comprising:
 - a principal detector for detecting x-rays generated by said x-ray source so
 as to generate a first intensity magnitude;
 - an auxiliary detector for detecting x-rays generated by said x-ray source so as to generate a second intensity magnitude, said auxiliary detector including an absorber that preferentially absorbs x-ray photons having a relatively low energy;
- d) a processor for calculating CT numbers of said target object so as to reconstruct a CT image of said target object;

and

e) a feedback controller for providing to the voltage source a voltage control signal; wherein said voltage control signal is adjusted as a function of a ratio of said first and second intensity magnitudes so as to maintain said voltage substantially constant at a reference level established during calibration, thereby substantially reducing in said CT system a variation in the measured values of CT numbers; and

wherein said reference level is the magnitude of the voltage at which calculation by said CT system of a sample having a known CT number value yields the correct known CT number value.

- 18. An apparatus for stabilizing CT number calculations by a CT system having an x-ray source for generating x-rays in response to a voltage provided by a voltage source, the apparatus comprising:
 - a) a kV meter for measuring a spectrum of x-rays generated by said x-ray source so that the voltage provided by the voltage source can be adjusted to a reference level at which the CT number of said sample as measured by said CT system is substantially equal to said known CT number value; and
 - b) a feedback controller for providing to the voltage source a voltage control signal based on said measured x-ray spectrum so that the voltage can be adjusted in response to said control signal so as to maintain the voltage constant at said reference level, thereby substantially reducing a variation in the calculated values of the CT numbers of a target object, as determined by said CT system.
- 19. An apparatus for stabilizing CT number calculations in a CT system having an x-ray source for generating x-rays in response to a voltage provided by a voltage source, the apparatus comprising:
 - a) a principal detector for detecting x-rays generated by said x-ray source so as to generate a first intensity magnitude;
 - b) an auxiliary detector having an absorber that preferentially absorbs x-rays photons having a relatively low energy, the auxiliary detector being adapted to detect x-rays generated by said x-ray source so as to generate a second intensity magnitude; and
 - c) a feedback controller for providing to the voltage source a voltage control signal;

wherein said voltage control signal is adaptively adjusted, based on a predetermined function of said first intensity magnitude and said second intensity magnitude, so as to maintain the voltage provided to the x-ray source constant at a reference level for which the calculation by said CT system of the CT number of a sample having a known CT number value yields the correct known CT number value.

20. An apparatus according to claim 19, wherein said predetermined function is a ratio between said first intensity magnitude and said second intensity magnitude.